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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

HAROLD A. McMASTER ET AL.

Group Art Unit: 1731

Examiner: S. Vincent

Serial No.: 08/655,853

Filed: May 30, 1996

For: GLASS SHEET BENDING AND TEMPERING APPARATUS

Attorney Docket No.: GLT 1618 R

APPEAL BRIEF

Box AF
Commissioner for Patents
United States Patent and Trademark Office
Washington, D.C. 20231

Sir:

I. REAL PARTY IN INTEREST

Glasstech, Inc., the assignee of all right, title and interest in U.S. Patent No. 4,883,527 and this reissue application, is the real party in interest in this reissue application.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8

I hereby certify that this paper, including all enclosures referred to herein, is being deposited with the United States Postal Service as first-class mail, postage pre-paid, in an envelope addressed to: Box AF, Commissioner for Patents, United States Patent and Trademark Office, Washington, D.C. 20231 on:

September 6, 2001	Earl J. LaFontaine	Earl J. LaFontaine
Date of Deposit	Name of Person Signing	Signature

III. STATUS OF CLAIMS

Claims 1-16 issued on November 28, 1989. These claims were finally rejected as being based upon a defective declaration under 35 U.S.C. § 251. This rejection was obviated by Applicant's submission of a Supplemental Oath, and these claims are therefore now in condition for allowance.

Claims 17-27 were added during the prosecution of previous reissue applications from which the instant reissue application is a continuation. Claims 17-26 were cancelled. Claim 27 remains pending.

Claims 28-30 were added during the prosecution of the instant reissue application. Claims 28 and 29 were also cancelled. Claim 30 remains pending.

Claims 27 and 30 were finally rejected under 35 U.S.C. § 112, paragraph 1. Claim 27 was also finally rejected under 35 U.S.C. § 251.

Owner appeals the Examiner's rejection of claims 27 and 30. The text of these claims is attached as Appendix A.

IV. STATUS OF AMENDMENTS

All of the pending claims (1-16, 27 and 30) were finally rejected on March 9, 2001 as being based upon a defective oath/declaration under 35 U.S.C. § 251. On August 2, 2001, applicants submitted an Amendment Under 37 C.F.R. § 1.116 including a Supplemental Reissue Declaration which overcame this final rejection. In an August 17, 2001 communication, the Examiner entered the Supplemental Reissue Declaration and confirmed that the rejection over 35 U.S.C. § 251 has been obviated. Thus, only claims 27 and 30 stand finally rejected on this appeal.

V. SUMMARY OF THE INVENTION

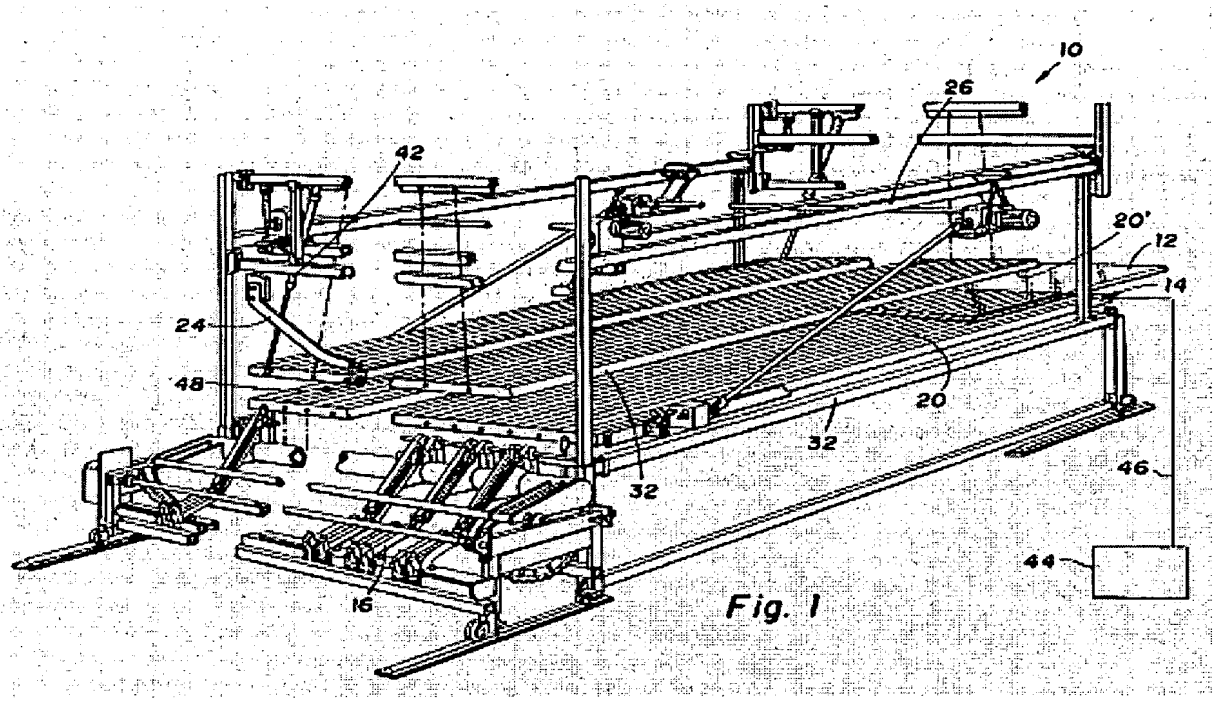

Fig. 1

The invention is a glass sheet bending and tempering system, generally indicated by the reference numeral 10 in Figure 1, comprising lower and upper deformable platens 14 and 22 (shown in FIG. 3), each of which includes elongated quench tubes 32 (FIGS. 1-3) which are substantially parallel to each other and have quench openings.

The lower platen has deformable drive shafts 28 (see FIG. 2, next page) which extend between the elongated quench tubes thereof and are oriented to be substantially perpendicular to those quench tubes, and are which are rotatably supported by those quench tubes.

The lower platen also has drive wheels 30 (FIG. 2) supported on the deformable drive shafts at spaced locations to engage and move a glass sheet. An actuator 16 (FIG. 1) is connected to the lower platen for causing deformation of the lower platen and the quench

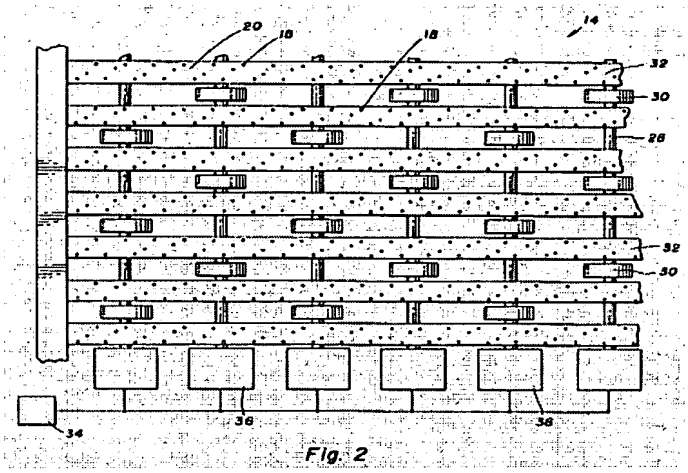

Fig. 2

tubes. The upper platen includes idler shafts 38 and idler wheels 40 (FIG. 3) to engage the glass sheet as it is being bent and tempered. The actuator causes deformation of the lower platen with the upper platen as a glass sheet is bent about a direction parallel to the quench tubes to conform the tubes to a desired bent shape of the glass sheet. Means 44 (FIG. 1) are provided to supply quenching gas to the quench openings of both platens after bending has finished to thereby temper the glass sheet between the platens.

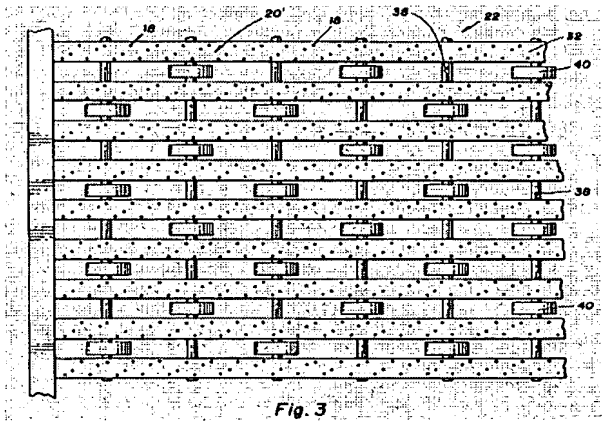

Fig. 3

In the embodiment of claim 30, means for reversibly driving the drive wheels (control 34 and electric motors 36, shown in FIG. 2) are provided to oscillate the glass sheet during the bending and tempering of the glass sheet.

VI. ISSUES

There are two issues presented by the Appeal.

The first issue is whether or not claims 27 and 30 contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. In particular, the first issue on this appeal is whether the added language in each of claims 27 and 30 relating to the "elongated quench tubes which extend in a spaced apart relationship to each other in the direction of conveyance of the glass sheet" and "deformable drive shafts which extend between the elongated quench tubes thereof and are oriented to be generally transverse to the direction of travel to the glass sheet" are supported by the specification when the exact words were not in the original specification, but where the single embodiment disclosed in the drawings clearly and irrefutably discloses the claimed shape and orientation of the quench tubes and drive shafts.

The second issue is whether or not claim 27 is an improper recapture of subject matter surrendered in a parent application upon which the application corresponding to the present reissue application is based. In particular, the issue is whether claim 27, directed to a quench which is deformable to conform to the shape of a bent glass sheet is not obtainable in this reissue application, where the alleged surrender of subject matter contained in claim 27 is inferred from the cancellation of broader quench claims in a parent application and where there is clear evidence in the file history that no such surrender was intended.

VII. GROUPING OF CLAIMS

Claims 27 and 30 stand or fall together with regard to the issue of whether these claims comply with 35 U.S.C. § 112, first paragraph.

Only claim 27 is affected by resolution of the issue of whether this claim is barred under the recapture doctrine.

VIII. ARGUMENT

A. The Drawings and Specification, As originally Filed, Support Applicants' Amendments to the Specification and to Claims 27 and 30

1. The Examiner's Objection to Amendment Of the Specification to Include Language Describing the Shape and Orientation of the Quench Tubes and the Orientation of the Drive Shafts Is Improper as the Language Proposed to Be Added by Amendment Is Clearly Supported by the Drawings

In an Amendment filed February 8, 2001, applicants amended column 3, lines 28-40 of the specification as follows:

The lower platen includes deformable drive shafts, drive wheels mounted on the drive shafts to engage the heated glass sheet and provide movement thereof during platen deformation that provides the bending. A plurality of elongated [Q]quench tubes which extend in a spaced apart relationship to each other in the direction of conveyance of the glass sheet define the quench openings of the lower platen. The drive shafts extend between the elongated quench tubes, are oriented to be generally transverse to the direction of travel of the glass sheet, and the quench tubes rotatably support the drive shafts thereof such that the drive wheels move the heated glass sheet during the bending and quenching. The upper platen includes idler shafts, and idler wheels mounted on the idler shafts to engage the heated glass

sheet and to rotate with movement of the glass sheet. Similarly, elongated quench tubes which extend in a spaced apart relationship to each other in the direction of conveyance of the glass sheet define the quench openings of the upper platen and rotatably support the idler shafts.

The Examiner objects to the specification as amended as adding new matter. In particular, the Examiner indicates that the following material (shown in italics) is not supported by the original disclosure: "a plurality of ***elongated quench tubes which extend in a spaced apart relationship to each other in the direction of conveyance of the glass sheet"; "the drive shafts extend between the elongated quench tubes, are oriented to be generally transverse to the direction of travel of the glass sheet."*** As more fully explained below, the Examiner's objection to the specification is improper, since the specification and drawings clearly convey to one of ordinary skill in the art that applicants were in possession of these details of their invention as of the filing date of the original application.

The purpose of the description requirement is to "ensure that the inventor had possession, as of the filing date of the application relied on, of the specific subject matter later claimed by him." In *re Edwards*, 568 F.2d 1349, 1351-1352, 196 U.S.P.Q. 465, 467 (C.C.P.A. 1978). The test has also been expressed as whether the disclosure of the application relied upon "reasonably conveys to the artisian that the inventor had possession at the time of the latter claimed subject matter." In *re Kaslow*, 707 F.2d 1366, 1375, 217 U.S.P.Q. 1089, 1096 (Fed. Cir. 1983).

The fact of the quench tubes being elongated is irrefutable from a review of Figures 1-3. Similarly, the general location of the quench tubes (i.e., spaced apart from each other), and the general orientation of the flexible shafts (generally transverse to the direction of travel of the glass sheet) is clearly conveyed by the drawings, as well as by the supporting language of the specification as described below.

The specification, as now amended, reads "a plurality of elongated quench tubes which extend in a spaced apart relationship to each other in the direction of conveyance of the glass sheet define the quench openings of the lower platen." The language added to the language of the original patent specification is "a plurality of elongated", and "which extend in a spaced apart relationship to each other in the direction of conveyance of the glass sheet".

It is submitted that "a plurality of elongated" is not new matter since the original specification states "quench tubes 32 define the quench openings 18 of the lower platen 14" (at col. 5, ll. 44-45) and "the first platen includes quench openings 18 throughout a surface 20 of the platen, best seen in Figure 2." (At col. 4, ll. 57-58). This language, read with reference to Figure 2, clearly identifies the quench tubes 32 as being a plurality and elongated. The disclosure of "tubes" indicates a plurality of tubes. And, though the word "elongated" did not appear in the original specification, this word clearly and accurately describes the shape of the quench tubes 32 shown in Figures 1, 2, and 3. Indeed, Webster's College Dictionary defines elongated as "long and thin".

The same language from the specification and Figures 1-3 similarly support the remaining new language specifying that the quench tubes "extend in a spaced apart relationship to each other in the direction of conveyance of the glass sheet." In particular, Figure 1 includes glass sheet 12, and the supporting language of the specification states "[a] apparatus 10 comprises a first platen 14 for receiving the heated glass sheet 12 to be bent." (Col. 4, ll. 45-47). Also, the original language of the specification stated "quench tubes 32 define the quench openings 18 of the lower platen 14 and rotatably support drive shafts 28 such that the drive wheels 30 move the heated glass sheet 12..." (Col. 5, ll. 44-47). The original language of the specification also stated "a control 34 and reversible drive electric motors 36 drive drive wheels 30 to index the glass sheet 12 into the glass bending and tempering apparatus, oscillate the glass sheet during the bending and tempering and index the glass sheet out of the apparatus..." (Col. 5, ll. 47-53). This language, coupled with the illustrations of Figure 2,

to which the language refers, illustrate clearly and unambiguously that the quench tubes are spaced apart from each other. As well, this language, coupled with Figures 1 and 2, disclose unmistakably that the elongated quench tubes extend in the direction of conveyance of the glass sheet.

It is well settled law that matter disclosed in the drawings alone, and not described in the specification as filed, can be sufficient to support valid claims. *Kendall v. Searles,* 173 F.2nd 986, 991 36 C.C.P.A. at 1045, 1050 (C.C.P.A. 1949). (Claims relating to different rotating constructions, including language relating two elements as being in concentric alignment are disclosed by an applicant where "[H]is drawings show that all parts of his construction are concentric..."). 173 F.2d at 991; 36 C.C.P.A. at 1050, 1051. See also *Application of Adolph Wolfensperger,* 307 F.2d 950, 954; 49 C.C.P.A. 1075, 1080 (C.C.P.A. 1962). (Applicant's original disclosure shows with sufficient clarity that he was in possession of an invention wherein claimed dimension of a packing ring having "a mean diameter corresponding approximately to the mean diameter of said chamber" where "[L]ooking at appellant's Figure 5, it is obvious that the ring as shown does have a mean diameter corresponding approximately to the mean diameter of the annular chamber formed by channel 88 and surface 84"). 302 F.2d at 954; 49 C.C.P.A. at 1078, 1079. See also *Application of Lawrence A. Heinle*, 342 F.2d 1001, 1007, 52 C.C.P.A. 1164, 1172 (C.C.P.A. 1965). (Claim that the width of the apertures in the core of a toilet paper roll as "approximately 1/4 of the circumference of said core" disclosed despite absence of support in the specification where "Figure 2 depicts a pair of slots with the claimed width dimensions..."). 342 F.2d at 1007, 52 C.C.P.A. at 1173.

The above-cited language from the original specification, and the illustration of Figures 2 and 3 in particular, supports the other amended language of the specification which specifies "the drive shafts extend between the elongated quench tubes, are oriented to be generally transverse to the direction of travel of the glass sheet, and the quench tubes

rotatably support the drive shafts thereof..." (new language underlined). In particular, the language in the original specification describing the drive shafts being rotatably supported by the quench tubes, coupled with the illustration of Figure 2 (for the lower platen) and Figure 3 (for the upper platen) provide clear support for the new language added by amendment that the drive shafts are "oriented to be generally transverse to the direction of travel of the glass sheet". Again, the original specification unambiguously states that the "quench tubes 32...rotatably support drive shaft 28 such that the drive wheels move the heated glass sheet 12 during the bending and quenching." (Col 5, ll. 44-47). This language describes the arrangement depicted in Figure 2, which illustrates that the rotation of the wheels on the flexible shafts supported by the elongated tubes clearly requires that the shafts be mounted in a direction generally transverse to the direction of conveyance of the glass sheet for the driven wheels 30 to drive the glass sheet in and out of the apparatus as shown in Figure 1.

2. Claims 27 and 30 Clearly Describe the Invention Conveyed by the Written Description and Drawings of the Application as Originally Filed

This same language, relating to the shape and orientation of the quench tubes and the orientation of the flexible shafts, also added to claims 27 and 30, is not new matter. As described above, it is clearly and unambiguously conveyed in the original specification and drawings.

Indeed, there is no way anyone of ordinary skill in the art would *not* understand from this disclosure that the sole embodiment pictured in the figures includes generally spaced apart, elongated quench tubes extending in the direction of conveyance of the glass sheet and flexible shafts that are generally transverse to the direction of travel of the glass sheet. In fact, these are the *only* shapes and orientations specifically disclosed by applicants in the lone pictured embodiment of their invention. To quote the Court in *Wolfensperger*, "[I]ndeed, it seems to us that the Patent Office is stretching its imagination to find a lack of disclosure in

this regard." 302 F.2d at 1080. As such, the specification and claims 27 and 30 as presently amended are believed to satisfy the requisites of both 35 U.S.C. § 132 and 35 U.S.C. § 112, paragraph 1.

In light of the foregoing, Owner respectfully requests that this Board reverse the Examiner's objection to the specification and rejection of Claims 27 and 30.

B. Claim 27, Directed to Applicants' Improved Quench, Is Not an Improper Recapture

Claim 27 was also rejected under 35 U.S.C. 251 as being an improper recapture of broadened claim subject matter surrendered in the application for the patent upon which the present reissue is based.

1. The Test for Recapture

The reissue statute, 35 U.S.C. § 251 provides that:

> Whenever any patent is, through error without any deceptive intention, deemed wholly or partly inoperative or invalid, by reason of a defective specification or drawing, or by reason of the patentee claiming more or less than he had a right to claim in the patent, the Commissioner shall, on the surrender of such patent and the payment of the fee required by law, reissue the patent for the invention disclosed in the original patent, and in accordance with a new and amended application, for the unexpired part of the term of the original patent. No new matter shall be introduced into the application for reissue.

Although § 251 permits a reissue patent to be broader than the original, a patent holder can never "regain through reissue ... subject matter that he surrendered in an effort to obtain allowance of the original claims." *In re Clement*, 131 F.3d 1464, 1468 (Fed. Cir. 1997). When subject matter has been deliberately surrendered in the original patent

prosecution, no "error" within the meaning of the reissue provisions of the Patent Act has occurred and, thus, no valid basis exists for reissuing the patent. *See, Hester Industries, Inc. v. Stein, Inc.*, 142 F.3d 1472, 1480 (Fed. Cir. 1998).

Thus, an impermissible recapture of surrendered subject matter occurs where: (1) the reissue claims are broader than the original claims; (2) the relevant subject matter was surrendered; and, (3) the "surrendered subject matter has crept into the re-issue claim." *Clement*, 131 F.3d at 1468-9. On reissue, the "[patentee] is estopped from attempting to recapture the precise limitation he added to overcome prior art rejections." *Pannu v. Storz Instruments, Inc.*, No.00-1482, 2001 U.S. App. LEXIS 16645, at 13 (Fed. Cir. 2001).

2. Applicants Did Not Surrender This Subject Matter

Applicants acknowledge that claims directed to a glass sheet tempering apparatus were presented in a parent application, Serial No. 07/083,685. Three claims, claims 12-14, were cancelled in response to a rejection under 35 U.S.C. 102(e) as being anticipated by Kahle (U.S. Patent No. 4,376,643). It should be noted however, that the cancellation of claims 12-14 in a parent is not dispositive of the issue of whether applicants intended to surrender this subject matter.

In fact, it is clear from the original specification of the later application for the '527 patent (the subject of this reissue application) that applicants did *not* intend to surrender their right to any claim for a tempering apparatus. The application that issued into the '527 patent was filed on September 27, 1988 with a different title than the parent application. The new title was "BENT GLASS SHEET QUENCH". Moreover, the specification included the object "to provide an apparatus that has movable quench openings that move with the surfaces of the glass sheet to provide equal thermal conditions during tempering and a more uniformly tempered glass sheet." (Col. 2, ll. 38-42). This application was filed *after* claims 12-14 (the

claims directed to a tempering apparatus in the parent application) were cancelled by amendment in the parent application on May 11, 1988. It is thus clear that, although applicants erroneously omitted claims to the quench in the follow-on application, they did not consciously intend to surrender that subject matter. Indeed, the fact that applicants changed the title of this continuation application from "Glass Bending and Tempering Apparatus" (the title of the parent application), to "Bent Glass Sheet Quench", clearly refutes any inference of surrender from the cancellation of claims 12-14 in the parent. For this reason alone, Claim 27 is not barred in this reissue application by the recapture doctrine.

3. Claim 27 Is Narrower In Scope Than Any of the Cancelled Quench Claims

It is also clear from the cases cited by the Examiner that the presentation of claim 27 by applicants in this reissue is not recapture, because the scope of claim 27 is narrower than the scope of any of the three claims which were cancelled in the parent application.

As outlined by the Federal Circuit in *In re Clement*:

> In both *Mentor* and *Ball*, the relevance of the prior art rejection to the aspects narrowed in the reissue claims was an important factor in our analysis. From the results and reasoning of those cases, the following principles flow:
>
> (1) if the reissue claim is as broad or broader than the cancelled or amended claim in all respects, the recapture rule bars the claim;
>
> (2) if it is narrower in all aspects, the recapture rule does not apply, but other rejections are possible;
>
> (3) if the reissue claim is broader in some aspects, but narrower in others, than:
>
> (a) if the reissue claim is as broad as or broader in an aspect germain to a prior art rejection, but narrower in another aspect

completely unrelated to the rejection, the recapture rule bars the claim;

(b) if the reissue claim is narrower in an aspect germain to prior art rejection, and broader in an aspect unrelated to the rejection, the recapture rule does not bar the claim, but other rejections are possible.

In re Clement, Fed. 3rd, 1464, 1470 (Fed Cir. 1997).

In the present application, claim 27 is narrower in all aspects than the previously cancelled claims. The broadest of the cancelled claims, Claim 12, describes a tempering apparatus including a pair of opposed platens, each platen having a plurality of quench tubes, and each of the quench tubes including quench openings through which quench gas may be supplied to temper the glass sheet, with the spent quenching gas escaping between the quench tubes to prevent a buildup in pressure. Claim 13 added a conveyor for conveying the glass sheet between the upper and lower platens, and Claim 14 added wheels mounted between the quench tubes of the lower platen to support and convey the glass sheet.[1] Thus, even the narrowest of these cancelled claims describes a quench without specifying whether or how the quench might be adjusted to conform to the shape of a bent glass sheet.

Claim 27 specifies the following elements not found in any of the cancelled claims:

(1) [the lower platen] having deformable drive shafts.
(2) which deformable shafts are rotatably supported by those quench tubes.
(3) [the lower platen] also having drive wheels supported on the deformable drive shafts thereof at spaced locations to engage and move the glass sheet
(4) an actuator connected to the lower platen so the quench tubes are movable as a glass sheet is bent to generally conform the tubes to a desired bent shape of a glass sheet
(5) elongated [tubes]

[1]The full text of cancelled Claims 12-14 from parent applicaiton Serial No. 07/083,675 is set forth in Appendix B to this Brief.

(6) which extend in a spaced apart relationship to each other
(7) in the direction of conveyance of the glass sheet

The language defining element numbers 1-4 is found verbatim in the original specification. The language describing elements 5-7 is found in the reissue application as presently amended. In both cases, this language clearly describes a tempering apparatus that is narrower in many respects to the tempering apparatus of claims 12-14 in the parent application. In its broadest sense, Claim 27 describes a deformable quench including an actuator connected to the lower platen so that the quench tubes of the lower platen are movable, as a glass sheet is bent, to conform the quench openings in the tubes to the shape of the bent glass sheet. This is clearly narrower in scope than any of the cancelled claims, which are directed broadly to a quench design including tubes, but not limited to one which may be actuated to be movable as a glass sheet is bent to conform generally to the shape of the bent glass sheet.

Moreover, the deformable quench of claim 27, as well as the specific additional claimed features listed above, are all germain to the prior art rejection of the cancelled claims, since none of these features are shown in the cited reference. Indeed, there is no evidence that applicants intended to surrender this claimed subject matter, since none of it appears in the cancelled claims.

CONCLUSION

In summary, the amendments to the specification and claims 27 and 30 do not introduce new matter, since the language of the specification and/or the as-filed figures clearly convey that the inventor was in possession of the claimed invention at the time the application was first filed. Moreover, claim 27 is not barred by the recapture doctrine for two reasons. First, it is clear from the application file history that applicants did not intend to surrender the

claimed subject matter. Second, the subject matter of claim 27 is narrower in all respects to the cancelled quench claims.

In light of the foregoing, Owner respectfully requests that this Board reverse the Examiner's rejection of claims 27 and 30 under 35 U.S.C. § 112, first paragraph, and Owner requests that this Board reverse the Examiner's rejection of claim 30 under 35 U.S.C. § 251.

A check in the amount of $210, representing the $155 fee for filing the Appeal Brief as specified in 37 C.F.R. § 1.17(c) and the $55 fee for a one-month extension for a small entity, is enclosed. Please charge any additional fee or credit any overpayment in connection with this filing to our Deposit Account No. 02-3978. A duplicate of this page is enclosed for this purpose.

Respectfully submitted,

GLASSTECH, Inc., and

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Enclosure - Appendices A and B

APPENDIX A - CLAIMS ON APPEAL

27. (New) An apparatus for uniformly tempering a glass sheet comprising: opposed lower and upper platens each of which includes elongated quench tubes which extend in a spaced apart relationship to each other in the direction of conveyance of the glass sheet and have quench openings; the lower platen having deformable drive shafts which extend between the elongated quench tubes and are oriented to be generally transverse to the direction of travel of the glass sheet, and which deformable drive shafts are rotatably supported by those quench tubes, and the lower platen also having drive wheels supported on the deformable drive shafts thereof at spaced locations to engage and move the glass sheet; an actuator connected to the lower platen so the quench tubes are movable as a glass sheet is bent to generally conform the tubes to a desired bent shape of a glass sheet; and means to supply quenching gas through the quench tubes to uniformly temper a glass sheet therebetween.

30. (New) A glass sheet bending and tempering apparatus comprising: lower and upper opposed deformable platens each of which includes elongated quench tubes which are substantially parallel to each other and have quench openings; the lower platen having deformable drive shafts which extend between the elongated quench tubes thereof and are oriented to be substantially perpendicular to those quench tubes and which are rotatably supported by those quench tubes, and the lower platen also having drive wheels supported on the deformable drive shafts thereof at spaced locations to engage and move the glass sheet to be bent; the upper platen having idler shafts mounted on the elongated quench tubes thereof and also having idler wheels mounted by the idler shafts at spaced locations to engage the glass sheet to be bent; actuating means for causing deformation of the lower platen with the upper platen being conformably deformable to the shape of the lower platen as the lower platen is bent about a direction parallel to the elongated direction of the quench tubes from a flat shape to a bent shape with the glass sheet disposed between the platens as the quench

openings of the elongated quench tubes and the wheels are moved with the platens as the wheels engage and bend the glass sheet; means to supply quenching gas to the quench openings of both platens after bending has finished to thereby temper the bent glass sheet between the platens; and drive means for reversibly driving the drive wheels to move the glass sheets during the bending and tempering of the glass sheet.

APPENDIX B - CLAIMS 12-14
CANCELLED IN PARENT APPLICATION

12. A glass sheet tempering apparatus comprising:

a pair of opposed palatens [*sic*] between which a heated glass sheet to be tempered is received;

each platen including a plurality of quench tubes that are spaced from each other; and

each quench tube having quench openings through which quenching gas is supplied for impingement with the glass sheet to perform the tempering, the spent quenching gas escaping between the spaced quench tubes to prevent the build-up of pressure.

13. A glass sheet tempering apparatus as in claim 12 wherein the opposed platens are positioned at upper and lower positions, and further including a conveyor for conveying the glass sheet between the upper and lower platens.

14. A glass sheet tempering apparatus as in claim 13 wherein the conveyor includes spaced wheels mounted on the quench tubes of the lower platen, and the glass sheet being supported for conveyance by the spaced wheels on the quench tubes of the lower quench tubes.